



PACIFIC CREST ENVIRONMENTAL

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SOURCE CONTROL EVALUATION REPORT

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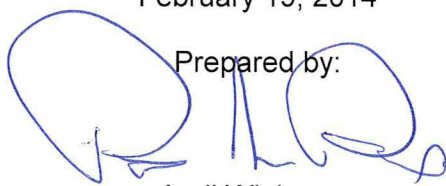
OREGON DEQ ECSI FILE NO. 2426

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1.0 INTRODUCTION

1.1 PURPOSE

This Source Control Evaluation (SCE) Report has been prepared by Pacific Crest Environmental, LLC (Pacific Crest) on behalf of the Christenson Oil Company (Christenson Oil) to present the results of a stormwater SCE at the Christenson Oil Facility (Facility) located at 3821 N.W. St. Helens Road in Portland, Oregon (the Site). A Site Location Map and Detailed Site Plan are provided as Figure 1 and Figure 2, respectively.

This SCE was conducted in response to the Oregon Department of Environmental Quality (DEQ) correspondence dated January 22, 2010 requesting that Christenson Oil perform a stormwater SCE to identify, evaluate, and control sources of contamination that have the potential to impact the Willamette River in a manner consistent with the DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ, 2009).

1.2 SOURCE CONTROL OBJECTIVE

The objective of this stormwater SCE Report is to demonstrate that existing and potential sources of contamination at the Site have been addressed and that no additional characterization or source control measures are needed at the Site.

1.3 REGULATORY FRAMEWORK

The DEQ has designated the Facility as an Upland Site in the Remedial Investigation/Feasibility Study (RI/FS) for the Portland Harbor Superfund Site. The DEQ and US Environmental Protection Agency (EPA) have developed the Portland Harbor Joint Source Control Strategy (JSCS) to identify, evaluate, and control sources of contamination that may reach the Willamette River. As such, it is necessary for Upland Sites in Portland Harbor to evaluate the stormwater pathway to identify upland sources of contamination that adversely impact, or have the potential to adversely impact, the Willamette River, and to implement appropriate source control measures (SCMs) to the extent practical prior to sediment cleanup in the Portland Harbor Superfund Site.

In addition to its designation as an Upland Site for the Portland Harbor Superfund Site RI/FS, recent and historical environmental investigation and monitoring activities have been conducted to assess conditions associated with historical releases of petroleum hydrocarbons at the Site. Groundwater monitoring and remedial activities have and continue to be conducted under the guidance of the DEQ Voluntary Cleanup Program (VCP).

Stormwater data collected for the Facility's National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge General Permit 1200-Z (NPDES General Permit) was integrated, to the extent applicable, with the stormwater SCE. Stormwater samples collected for the NPDES General Permit prior to the implementation of SCMs at the Site provide evidence of SCM effectiveness and are, therefore, provided as Table 1.

1.4 REPORT ORGANIZATION

The Report will be organized as follows:

Section 1.0 Introduction – Presents an introduction, a statement of objectives, project organization and responsibilities, and report organization.

Section 2.0 – Site Description and History – Presents a Site description, a summary of current and historical Site activities, and a description of the Site's stormwater conveyance system.

Section 3.0 – Potential Sources and Contaminants of Interest – Provides information regarding potential contaminant sources, outfall sediment data, and contaminants of interest (COIs).

Section 4.0 – Ongoing Stormwater Management Measures – Presents a summary of ongoing stormwater Best Management Practices (BMPs) conducted at the Site, and information on the mechanisms in place to document the ongoing activities.

Section 5.0 – Data Collection and Interpretation – Presents Site specific sampling procedures, a summary of data collected, and interpretation of those data.

Section 6.0 – Source Control Measures – Presents a detailed description of any source control evaluation measures used at the Site during the course of this evaluation.

Section 7.0 – Source Control Evaluation – Presents evidence to support the determination that stormwater source control has been accomplished, and no additional source control measures are required at the Site.

Section 8.0 – Findings and Conclusions – Presents findings and conclusions regarding the Site specific SCE.

Section 9.0 – References – Presents a bibliography identifying reports and documents referenced in this Report.

sewer. Wohlers field personnel attempted to survey the following sections of the stormwater system:

- The stormwater system located between CB-1/OWS in the loading area of the Site and the shared COP conveyance system in the adjacent right-of-way; and
- The stormwater system located between the Green Creek inlet and the confluence with the conveyance piping from CB-1/OWS.

The actual stormwater conveyance system survey videos are provided as Appendix B. Notable observations are listed below.

- Access to the sewer connecting the OWS to the catch basin was gained via a stormwater service vault in the NW St. Helens Road right-of-way. This section of sewer extends approximately 14 feet northwest of the service vault before turning sharply to the southwest toward the OWS. It appears that a “T” joint was used by the City of Portland during construction of the sewer rather than a 90 degree “elbow” joint; therefore, the northwestern opening of the “T” joint was intentionally blocked using cobbles, small boulders and cement to seal the unnecessary opening.
- Wohlers field personnel were unable to survey the northwest to southeast trending sewer section connecting City Manhole AAT511 to Manhole AAT510 located in the NW St. Helens Road right-of-way due to camera inaccessibility. Survey contractors reported that approximately fifty percent of the 12” concrete pipe was congested with gravel and cobbles, despite repeated attempts to clear the line using a Vactor[®] truck jetter.

An illustration of the sections of sewer that were successfully surveyed is provided as Figure 5. With the exception of the issues discussed above, no other notable observations were made during the stormwater conveyance system survey.

2.3 SITE OWNERSHIP AND OPERATING HISTORY

The Site has been operated by Christenson Oil and predecessor businesses since the late 1940s. Christenson Oil has conducted mixing, blending, packaging, and storage of various petroleum-based lubrication products in five tank farms located on Site (Figure 2), and in former underground storage tanks (USTs) which contained diesel, kerosene, and Stoddard Solvent. The former USTs were decommissioned between 1989 and 1993.

There have been several documented releases of petroleum products from ASTs and USTs on the property since 1975. The products reportedly released at the Site have included: base oil (Bright Stock), diesel fuel, kerosene, Stoddard Solvent (a type of mineral spirits), hydraulic oil, and chain oil. Following each release, mitigation measures were conducted to control the release; recover the lost product; and to clean up impacted media. Additional information regarding historical releases at the Site is provided in the *Expanded Preliminary Assessment Report* (XPA) prepared by Wohlers, dated December 4, 2006 (Wohlers, 2006A).

2.4 REGULATORY HISTORY

This section presents an overview of the regulatory history of the Site in relation to stormwater discharge, regulated tanks, and hazardous waste generation.

2.4.1 Stormwater Permit

Stormwater discharge from the Site is permitted under Christenson Oil's NPDES General Permit. The NPDES General Permit was initially obtained in 1998, with subsequent renewals as necessary. The NPDES General Permit specifies the requirements, limitations, and operating conditions for the management of stormwater at the Site, including implementation of an approved *Stormwater Pollution Control Plan* (SWPCP); regular stormwater and sediment monitoring; inspections and reporting; and guidance for SCMs. Prior to April 2008, the stormwater monitoring requirements under the permit consisted of the collection of a minimum of four grab stormwater samples per year and analysis of Total Suspended Solids (TSS), Oil & Grease (O&G), pH, copper, lead, and zinc, with monthly inspections consisting of visual assessments of floating solids and O&G sheen at representative discharge locations.

In April 2008, on the basis of an exemplary compliance record, Christenson Oil obtained a "Monitoring Waiver" (Waiver) from the COP Bureau of Environmental Services (BES) for all analytes except for pH. Christenson Oil subsequently obtained a Waiver for the analysis of pH in November 2008. The Waiver applied to the collection of stormwater samples at the outlet of the OWS. While the Waiver was in effect, the stormwater monitoring requirements consisted of monthly visual monitoring for the presence of O&G sheen and floating solids.

Stormwater discharge sampling resumed upon the DEQ issuance of a revised NPDES General 1200-Z Industrial Discharge Permit on July 1, 2012. The revised permit contains requirements for the analysis of additional analytes, as well as the frequency and timing of sample collection. A summary of the stormwater discharge sampling data conducted at the Site is provided in Table 1.

2.4.2 Regulated Tanks

There are currently forty-six ASTs located on the Site, many of which were installed in the 1990s. Specific details regarding each of the Tank Farms are provided below.

- Tank Farm A currently consists of ten exterior ASTs, the majority of which are believed to have been in place since the mid-1940s. The secondary containment berm surrounding the tanks was also constructed in the mid-1940s.
- Tank Farm B, consisting of three exterior ASTs, was installed in 1990 with the surrounding concrete containment area.
- Tank Farm C, consisting of thirteen interior ASTs, was installed in 1995 with the surrounding concrete containment area.
- Tank Farm D, consisting of ten interior ASTs, was installed in 1996 with the surrounding concrete containment berm.
- Certain interior ASTs housed in Tank Farm E are believed to have been in place since the mid to late 1940s. The remaining ASTs in Tank Farm E were installed in the mid to late 1970s.

- Three USTs which formerly operated at the Site for the storage of diesel, kerosene, and Stoddard Solvent were decommissioned between 1989 and 1993. No regulated USTs are currently located at the Site.

The ASTs range in capacity from 500-gallons to 30,000-gallons and have a combined oil storage capacity of approximately 306,600 gallons. The ASTs at the Facility are registered with the Oregon State Fire Marshal's office and the COP Fire Department.

Spill prevention measures for the ASTs are regulated by the EPA under 40 Code of Federal Regulations (CFR) Part 112 – Oil Pollution Prevention. In accordance with 40 CFR 112, Christenson Oil has prepared a Spill Prevention Control and Countermeasure (SPCC) Plan for the Facility (Wohlers 2003), and implements the spill prevention measures for the Site in accordance with the SPCC Plan. The particular handling practices for avoiding spills of raw materials and blended products at the Site are described in detail in the SPCC Plan. These measures include: preventing minor spills and/or drips from entering stormwater runoff during the transferring of product to and from ASTs, protection of exterior ASTs within secondary containment structures and within buildings (e.g., Tank Farms C and D). Additionally, Christenson Oil has implemented bulk unloading procedures to avoid spills and prevent pollution. Spill prevention control and countermeasures have been updated as needed over the years of operation.

2.4.3 Hazardous Waste Management

Christenson Oil operations at the Site do not include activities that generate hazardous waste requiring management under state or federal regulations.

2.5 PREVIOUS INVESTIGATIONS

This section presents a summary of the Site's status within the Portland Harbor Superfund Site and summarizes the cleanup action and environmental investigation activities that Christenson Oil has conducted at the Site.

2.5.1 Portland Harbor Superfund Site

On December 1, 2000, the EPA placed a heavily industrialized stretch of the Willamette River (Portland Harbor) on the Superfund National Priorities List (NPL). The EPA sent "Notice of Potential Liability" letters to potentially responsible parties (PRPs) associated with the Portland Harbor Superfund Site, including Christenson Oil. The EPA determined that sediments in the portion of the Willamette River designated as a Superfund Site, as well as soil and groundwater at sites located upland of the river (Upland Sites) within the boundaries of the Portland Harbor, are contaminated with various contaminants of concern (COCs), including metals, polycyclic aromatic hydrocarbons (PAHs), phthalates, polychlorinated biphenyls (PCBs), chlorinated pesticides, total petroleum hydrocarbons (TPH), and dioxins. The DEQ has been authorized to evaluate Upland Sites for potential sources of COCs that may have contributed to contaminated sediment in the Portland Harbor Superfund Site. Within the framework of the Portland Harbor Superfund Site, the Christenson Oil Site is an Upland Site located approximately at River Mile (RM) 8.8 on the west bank of the Willamette River. A chronologic summary of relevant investigation activities is presented below:

The data are inclusive of sampling upstream, downstream, and adjacent to the outfall. A figure depicting sample locations is provided as Appendix D.

3.3 CONTAMINANTS OF INTEREST

The following COIs are of primary concern with relation to the Site:

- TPH as gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO);
- PAHs and phthalates;
- Total metals (arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver and zinc);
- PCB Aroclors;
- Total organic carbon (TOC); and
- TSS.

The COIs for the Site were selected based upon the following criteria: previously identified COCs for the Site; historical and current Site operations; past environmental investigations; materials stored/handled at the Facility; compliance history with regulatory permits; and the contaminants identified in proximity to Outfall #18 in the Willamette River.

secondary containment for potential releases. The ASTs in Tank Farm E are situated on a concrete slab within the Main Building. The ASTs in Tank Farm E are equipped with a high level switch and alarm connected to a solenoid control valve designed to close automatically when the tanks are filled above a specified level, or upon power loss to the building. The blending ASTs in Tank Farm E are typically emptied at the close of each business day.

- Drums and other product containers are stored in covered areas of the Site, protected from precipitation, and out of the direct pathway of stormwater.
- Spill cleanup equipment (pads, booms, snakes, clay, drain mats, etc.) is maintained in easily accessible locations proximate to work areas where minor leaks or spills may occur to facilitate immediate containment and cleanup.
- At loading connection points, drip containers are utilized to catch minor spills.
- Vehicle washing is not permitted at the Site.

4.4 RUNOFF DIVERSION

Stormwater runoff diversion structures (e.g. gutters, drains, dikes, and graded pavement) collect and divert runoff to minimize the potential for contamination of stormwater and receiving waters. Stormwater runoff from the operations area of the Facility is directed by gutters and graded pavement toward catch basin CB-1. Catch basin CB-1 is equipped with a two-stage filter insert and is the only catch basin that receives stormwater from impervious surfaces on the Site. Filtered stormwater from catch basin CB-1 flows to an underground OWS prior to discharging to the COP shared conveyance system.

5.1 SAMPLING

The following sections present the methodologies employed during the collection and analysis of representative sediment and stormwater samples collected from the catch basin and OWS servicing the Site.

Historical sampling of catch basin sediment, stormwater, and surface water has been conducted at the Site for purposes unrelated to the SCE. The data have been provided to the DEQ in previously submitted reports and are also summarized in Tables 1 and 3.

5.1.1 Catch Basin Sediment Sampling

Sampling Framework

The purpose of the catch basin sediment sampling was to provide further data to establish Site-specific stormwater discharge COCs. Two samples were collected from catch basin CB-1. Laboratory analysis of the fine-grained sediments assisted in the identification of COIs that may not be detected in stormwater, such as hydrophobic PCBs and SVOCs. Sediment sampling results, in conjunction with historic catch basin sediment sampling data that exists for the Site, have assisted in the evaluation of the on-going effectiveness of SCMs and BMPs implemented at the Site.

Sampling Location Rationale

The rationale for selecting catch basin CB-1 as the sample location is presented below:

- Stormwater runoff from impervious surfaces in portions of the Site where industrial activities are conducted is diverted to catch basin CB-1, which serves as the representative catch basin sediment sampling location.
- Catch basin CB-1 is located near the eastern portion of the Site and east of the receiving/loading dock area of the Site (Figure 2). Catch basin CB-1 is the approved catch basin sediment sampling location that is used to satisfy the requirements of the NPDES General Permit.
- Catch basins CB-2 and CB-3, located in the right-of-way of NW St. Helens Road, are not representative of stormwater from the Site due to the collection of runoff from the NW St. Helens Road, and do not receive stormwater flow from areas where product blending, transfer, or storage operations are conducted.

A Catch Basin Sediment Sample Location Summary is provided as Table 4.

Analytical Suite Rationale

In accordance with the SCE Work Plan, catch basin sediment samples were analyzed based upon previously identified COIs for the Site; historical and current Site operations; past environmental investigations; materials stored/handled at the Facility; compliance history with regulatory permits; and the COCs related to Outfall #18 on the Willamette River. On the basis of these criteria, the following COIs were of primary concern:

- TPH as GRO by Northwest Method NWTPH-Gx;
- TPH as DRO and ORO by Northwest Method NWTPH-Dx;
- PAHs and phthalates by EPA Method 8270D SIM;
- Total Metals (arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver and zinc) by EPA Method 200.8;
- SVOCs by EPA Method 8270D; and
- PCB Aroclors by EPA Method 8082A.

Catch basin sediment samples were also analyzed for TOC (Method SW-846 9060), TSS (Method SM 2540G), and grain size distribution (Method ASTM D422).

Sampling Schedule

Catch basin sediment sampling was conducted prior to the stormwater sampling events and was used to develop an appropriate analytical suite for the stormwater samples. Christenson Oil conducts biannual sediment removal from catch basin CB-1 in the spring and fall. Catch basin sediment samples were collected prior to catch basin sediment removal to ensure sufficient sediment availability.

Sampling Collection Methodology

Catch basin sediment sampling was conducted in accordance with sample collection and documentation procedures described in *Standard Operating Procedures: Guidance for Sampling of Catch Basin Solids*, developed by the COP BES. The SOP provides detailed information regarding equipment and materials, procedures, sample acceptability, documentation, quality assurance, and quality control.

Sample collection included obtaining samples from both the filter fabric and the bottom of the catch basin. Samples were assigned a unique sample identifier which includes the following:

- Sample Medium (Sed);
- Sample location (CB-1);
- Sample position in catch basin (filter [F] or bottom [B]); and
- Sample date (mm/dd/yy).

Following collection, sediment samples were placed into appropriate containers supplied by the analytical laboratory. The sample containers were placed into a cooler and submitted to Friedman & Bruya, Inc. of Seattle, Washington (Friedman & Bruya), an Oregon Environmental Laboratory Accreditation Program analytical laboratory, under standard chain-of-custody protocol.

Documentation

Sampling of catch basin filter fabric and sediment from catch basin CB-1 was conducted under the direction of Wohlers field personnel on December 1, 2010. The catch basin sediment sampling event was conducted in accordance with both the SCE Work Plan and the *Standard Operating Procedures: Guidance for Sampling of Catch Basin Solids* (Catch Basin Sampling

The following analytes were identified to have a laboratory MDL exceeding the JSCS SLV in stormwater:

- Hexachlorobenzene, hexachlorocyclopentadiene, bis-(2-chloroethyl)ether, 3,3'-dichlorobenzidine, 4-nitroaniline, n-nitrosodimethylamine, n-nitroso-di-n-propylamine, pentachlorophenol, BEHP, 2-methylnaphthalene, Aroclor #1221, Aroclor #1232, Aroclor #1242, Aroclor #1248, Aroclor #1254, Aroclor #1260 and arsenic.

5.3.2 SLV Exceedances

The following table summarizes the SLV exceedances in the SCE data:

- Due to an unintentional oversight by field personnel, sediment sample SED-OWS-1-092012 was not analyzed for SVOCs by EPA Method 8270D. Consideration was given to resample the OWS sediment in order to analyze for SVOCs, more specifically phthalates; however, it was ultimately decided that the SVOC analysis alone did not warrant the collection of an additional sediment sample based on the historically low detection occurrence for SVOCs. Catch basin sediment samples detected concentrations of BEHP which exceeded the JSCS SLV for BEHP; however, in comparison to Risk-Based Concentration Levels based on various receptor scenarios for direct and indirect pathways, the concentrations detected at the Site appear to be of minimal concern. Furthermore, BEHP was not detected in any of the stormwater samples.
- Laboratory analysis of stormwater sample SW-OWS-EF-052112 detected certain heavy metals at elevated concentrations relative to results from previous sampling events. The field sampling technician noted the unusual presence of pollen in the stormwater sample. Studies (Perugini et al, 2011) (Botré and Conti, 2001) have documented the propensity of pollen to absorb and bioaccumulate heavy metals, particularly in urban or industrial locations. The anomalous concentrations of metals detected in stormwater sample SW-OWS-EF-052112 appear to be attributable to the presence of pollen in the stormwater sample rather than to anthropogenic sources at the Site.

The findings of the Outfall #18 inline solids investigation strongly support the conclusions from Site-specific SCE data, which are that Site stormwater discharges are not causing or contributing to adverse impacts to the receiving waterbody, nor are they likely to do so.

Periodicity of Site Activities

Consideration was given to the representativeness of catch basin sediment samples based on the potential for variability of Site activities. Catch basin CB-1 is cleaned/maintained on a semiannual basis, generally in the spring and fall. Timing of the catch basin sediment sampling was coordinated with Site personnel to ensure that sufficient and representative catch basin sediment had accumulated. Site operations are consistent and primarily include the loading and unloading of bulk lubricant products. Site operations occurring in the vicinity of catch basin CB-1 are primarily bulk truck and fork lift traffic near the receiving dock and the lubricant dispensing area.

Future Stormwater Management

Ongoing oversight of stormwater management practices currently being implemented at the Site will continue through the issuance of the NPDES General Permit.

- Contaminants that continue to exceed SLVs in stormwater following the implementation of SCMs include:
 - Benzo(a)anthracene;
 - Chrysene;
 - Benzo(b)fluoranthene;
 - Benzo(a)pyrene;
 - Indeno(1,2,3-cd)pyrene
 - Arsenic;
 - Cadmium;
 - Copper;
 - Lead;
 - Manganese;
 - Nickel; and
 - Zinc.
- Contaminants that continue to exceed SLVs in sediment following the implementation of SCMs include:
 - BEHP;
 - Indeno(1,2,3-cd)pyrene;
 - Benzo(g,h,i)perylene;
 - Cadmium;
 - Lead; and
 - Zinc.
- Sources of the COIs listed above include those associated with routine, light industrial activities. Specifically, these include:
 - Minor drips of oils, greases and fuels from bulk trucks and machinery;
 - Forklift and vehicle traffic resulting in tire dust and gradual erosion of asphalt surfaces;
 - Stormwater runoff from the Main Building's galvanized metal roof; and,
 - Atmospheric deposition of dust and pollen.
- The relatively minor exceedances of Site COCs as compared to other Portland Harbor industrial sites demonstrate that stormwater BMPs are strictly adhered to during Site operations. SCMs implemented at the Site address all potential sources of stormwater contaminants upon discharge to catch basin CB-1, and have proven to be effective through the reduction of COC concentrations in stormwater samples. Because stormwater runoff from the source area is currently treated by multiple SCMs, it appears unlikely that the implementation of additional SCMs would achieve better results. It can be concluded then that Site operations would need to disproportionately limit or stop

- TSS was detected at 14 mg/l during the first stormwater sampling event, and was not detected above the laboratory MDL during the three subsequent sampling events.
- The total area from which stormwater runoff can be discharged from the Site to the stormwater conveyance system is approximately 12,660 square-feet.

FIGURES

SOURCE CONTROL EVALUATION REPORT
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TABLES

SOURCE CONTROL EVALUATION REPORT
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ECSI NO. 2426

Table 3
Pre-SCE Stormwater Analytical Results Summary: 2001
Christenson Oil
3821 NW St. Helens Rd, Portland, Oregon
Pacific Crest PN 123-001

PAHs ¹ (µg/l)	CB-1 ² (11/19/2001)
Naphthalene	0.27
2-Methylnaphthalene	-
Acenaphthylene	0.27
Acenaphthene	<0.0500
Fluorene	0.13
Phenanthrene	0.2
Anthracene	0.07
Fluoranthene	0.34
Pyrene	0.65
Benzo(a)anthracene	0.18
Chrysene	0.2
Benzo(b)fluoranthene	0.59
Benzo(k)fluoranthene	0.18
Benzo(a)pyrene	0.62
Indeno(1,2,3-cd)pyrene	0.59
Dibenz(a,h)anthracene	0.12
Benzo(g,h,i)perylene	1.02

NOTES:

PAHs = polycyclic aromatic hydrocarbons

µg/l = micrograms per liter

MDL = Method Detection Limit

< = concentration was not detected at or above the laboratory MDL

¹ Semivolatile organic compound analysis by EPA Method 8270D SIM.

² Stormwater sample collected by Wohlers Environmental Services, Inc.

Table 7
Pre-SCE Sediment Analytical Data Summary: 2006
Christenson Oil
3821 NW St. Helens Rd, Portland Oregon
Pacific Crest PN 123-001

Analyte	Applicable Target Concentration ¹	CB-1 Sample (10/24/2006) ³
Polychlorinated Biphenyls⁷ (µg/kg)		
Arochlor #1016	530	<10
Arochlor #1221	NA	<10
Arochlor #1232	NA	<10
Arochlor #1242	NA	<10
Arochlor #1248	1,500	<10
Arochlor #1254	300	<10
Arochlor #1260	200	20
Organochlorine Pesticides⁸ (µg/kg)		
Aldrin	40	<67
α-BHC	NA	<67
β-BHC	NA	<67
δ-BHC	NA	<67
γ-BHC (Lindane)	4.99	<67
Chlorodane	0.37	<330
p,p'-DDD	0.33	<67
p,p'-DDE	0.33	<67
p,p'-DDT	0.33	<67
Dieldrin	0.0081	<67
Endosulfan I(Thiodan)	NA	<67
Endosulfan II	NA	<67
Endosulfan Sulfate	NA	<67
Endrin	207	<67
Endrin aldehyde	NA	<67
Endrin ketone	NA	<67
Heptachlor	10	<67
Heptachlor epoxide	16	<67
Methoxychlor	NA	<130
Toxaphene	NA	<670

APPENDIX A
HERITAGE SURVEY MAP

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APPENDIX B
STORM SEWER CONVEYANCE SYSTEM VIDEO

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APPENDIX C
TANK FARM SUMMARY

SOURCE CONTROL EVALUATION REPORT
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APPENDIX D
OUTFALL #18 SEDIMENT SAMPLE LOCATIONS

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APPENDIX E
LABORATORY ANALYTICAL REPORTS

SOURCE CONTROL EVALUATION REPORT
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PACIFIC CREST NO. 123-001
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 2, 2010 by Friedman & Bruya, Inc. from the Wohlers Environmental Services 10-0002(9) Christenson CB Sediment Sampling, F&BI 012027 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wohlers Environmental Services</u>
012027-01	SED-CB-1-F 120110
012027-02	SED-CB-1-B 120110

The samples were sent to Amtest for grain size and total organic carbon analyses. The report generated by Amtest will be forwarded to your office upon receipt.

The 8260C relative percent difference from the laboratory control sample and laboratory control sample duplicate analysis was outside of control limits for several compounds. The compounds were not detected, therefore the data were considered acceptable.

All other quality control requirements were acceptable.

